



NOV - 6 1995

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

JAMES B. HUNT JR.
GOVERNOR

DIVISION OF HIGHWAYS

GARLAND B. GARRETT JR.
SECRETARY

P. O. Box 748
Ahoskie, NC 27910
November 1, 1995

MEMORANDUM TO: Larry R. Goode, Ph. D., P. E.
State Highway Administrator

FROM: D. R. Conner, P. E.
Division Engineer - Division One

BY: L. C. McKeel *LC McKeel*
Division Staff Engineer

SUBJECT: Feasibility Study - NC 12 from US 158
through Duck Village, Dare County

Per your request, attached is a feasibility study of the subject route prepared by our office. The report includes information from a feasibility study prepared by Program Development. The previously completed study covers NC 12 from US 158 to Ocean Boulevard in Southern Shores (R-3335).

If you have any questions or need any additional information, please advise.

DRC/LCM
Atta.

cc: R. V. Owens III



FEASIBILITY STUDY
NC 12
FROM US 158 THROUGH DUCK VILLAGE
DARE COUNTY

Prepared By:

Division One
N. C. Department of Transportation

I. GENERAL DESCRIPTION

This is a feasibility study for the widening of NC 12 from the intersection of US 158 northward for approximately 6.1 miles (9.8 km) through the Duck Village to Barrier Island. The recommended typical cross-section from US 158 to Ocean Boulevard (1.7 mi or 2.7 km) is a four-lane 48 foot (14.6 m) travelway with 3-foot (0.9 m) paved shoulders on 90 feet (27.3 m) of existing right of way. The recommended typical cross-section from Ocean Boulevard to Duck Village (3.2 mi or 5.1 km) is a 4-lane 44 foot (13.4 m) travelway with 3-foot (0.9 m) paved shoulders on proposed 80 feet (24.4 m) of right of way. The right of way along this section is currently 60 feet. The recommended typical cross-section through the Village of Duck (1.2 mi or 1.9 km) is a 3-lane 36 foot (11.0 m) travelway with 4-foot (1.2 m) paved shoulders to accommodate pedestrian and bicycle traffic within 60 feet (18.3 m) of right of way. Estimated cost of the project is \$10,000,000 (\$3,500,000 for right of way and \$6,500,000 for construction).

This feasibility study is not intended to be a detailed investigation. It presents recommended cross-sections for improvements, general alignments of improvements, and estimated cost of construction and right of way. This study attempts to identify any potential environmental, permitting or other observed issues which deserve consideration in the planning and construction stages.

II. NEED FOR PROJECT

This project is classified as a Rural Major Collector on the Statewide Functional Classification System. The recommended improvements are needed to relieve congestion on NC 12 within the project area. The US 158-NC 12 intersection will be let to construction in October 1995 to improve traffic flow in front of the Aycock-Brown Welcome Center.

The southern terminus of this study begins at the proposed improved intersection of US 158 and NC 12. The northern terminus is at Barrier Island resort just north of Duck Village.

Within the study limits, NC 12 is a two-lane, two-way roadway from US 158 to Duck Village and portions of NC 12 through Duck are three-lane two-way roadways. The cross-section from US 158 to Ocean Boulevard is generally 21 feet (6.4 m) of pavement with 4-foot paved (1.2 m) shoulders. The existing right of way through this section is 90 feet (27.1 m), 60 feet (18.2 m) on the west side of NC 12 and 30 feet (9.1 m) on the east side. A traffic signal is located at the intersection of NC 12 and Chickahauk Trail. There is a flasher at the intersection of Ocean Boulevard and NC 12.

The cross-section from Ocean Boulevard to Duck Village is generally 22 feet (6.7 m) of pavement with 2-foot (0.6 m) paved shoulders. The existing right of way through this section is 60 feet (18.2 m), 30 feet on each side of the roadway centerline. Traffic signals are located at the intersection of NC 12 and Dogwood Trail, at NC 12 and Hillcrest Drive, and at NC 12 and 13th Street/Oats Trail.

The cross-section through Duck Village varies from a 22-foot (6.7 m) section of pavement with 2-foot (0.6 m) paved shoulders to a 33-foot (10.0 m) section of pavement with 2-foot (0.6 m) paved shoulders. For all sections of roadway within the study limits, the shoulders are undefined with sandy-type soil. There is no control of access along this portion of NC 12.

Estimated 1995 Average Daily Traffic (ADT) on NC 12 is 20,800 vehicles per day (vpd). The estimated 1995 SUMMER volume is 27,800 vpd. By the year of 2020, anticipated ADT is estimated at 39,000 vpd with no Mid-Currituck Sound Bridge. If the Mid-Currituck Sound Bridge is in place by the year 2020, then the ADT is estimated to drop to 28,400. The corresponding estimates of SUMMER volumes on NC 12 are 48,200 vpd and 38,000 vpd.

With the existing facility, traffic currently experiences a level of service (LOS) E. At LOS E, the average highway speed is 35 mph or less and generally traffic queued. With the recommended improvement, current traffic on NC 12 will experience a high LOS D, and an estimated LOS F on the year 2020 assuming construction of the Mid-Currituck Sound Bridge. With the Mid-Currituck Sound Bridge in place, the estimated ADT volume to capacity ratio for the studied section of NC 12 is 1.05 by the year of 2020.

During the period from July 1, 1987 through June 30, 1995, a total of 22 accidents were reported along the studied section of NC 12. This resulted in an accident rate of 6.02 accidents per 100 million vehicle miles (acc/100 mvm), compared to a statewide average of 207.30 acc/100 mvm. Rear end accidents accounted for 22.7 %; bicycle accidents, 9.1 %; angle accidents, 18.2 %; and left turn, same roadway 9.1 %. The proposed improvements should reduce the accident rate.

III. RECOMMENDATIONS

It is recommended that NC 12 be widened from US 158 northward approximately 6.1 miles (9.8 km) through Duck Village to Barrier Island. The recommended typical cross-section from US 158 to Ocean Boulevard is a four-lane, 48-foot (14.6 m) shoulder section with 3-foot (0.9 m) paved shoulders on 90 feet (27.3 m) of existing right of way. The recommended typical cross-section from Ocean Boulevard to Duck Village is a four-lane, 44-foot (13.4 m) shoulder section with 3-foot (0.9 m) paved shoulders on 80 feet (24.4 m) of proposed right of way. The recommended typical cross-section through the Village of Duck is a three-lane, 36-foot (10.8 m) shoulder section with 4-foot (1.2 m) paved shoulders on 60 feet

of existing right of way. The sandy nature of the soil precludes providing a definable shoulder.

One section of NC 12 near Barrier Island Station in Duck may require additional right of way or easements on the east side.

Total project cost is estimated at:

Right of Way: \$3,500,000
Construction: \$6,500,000
Project Cost: \$10,000,000

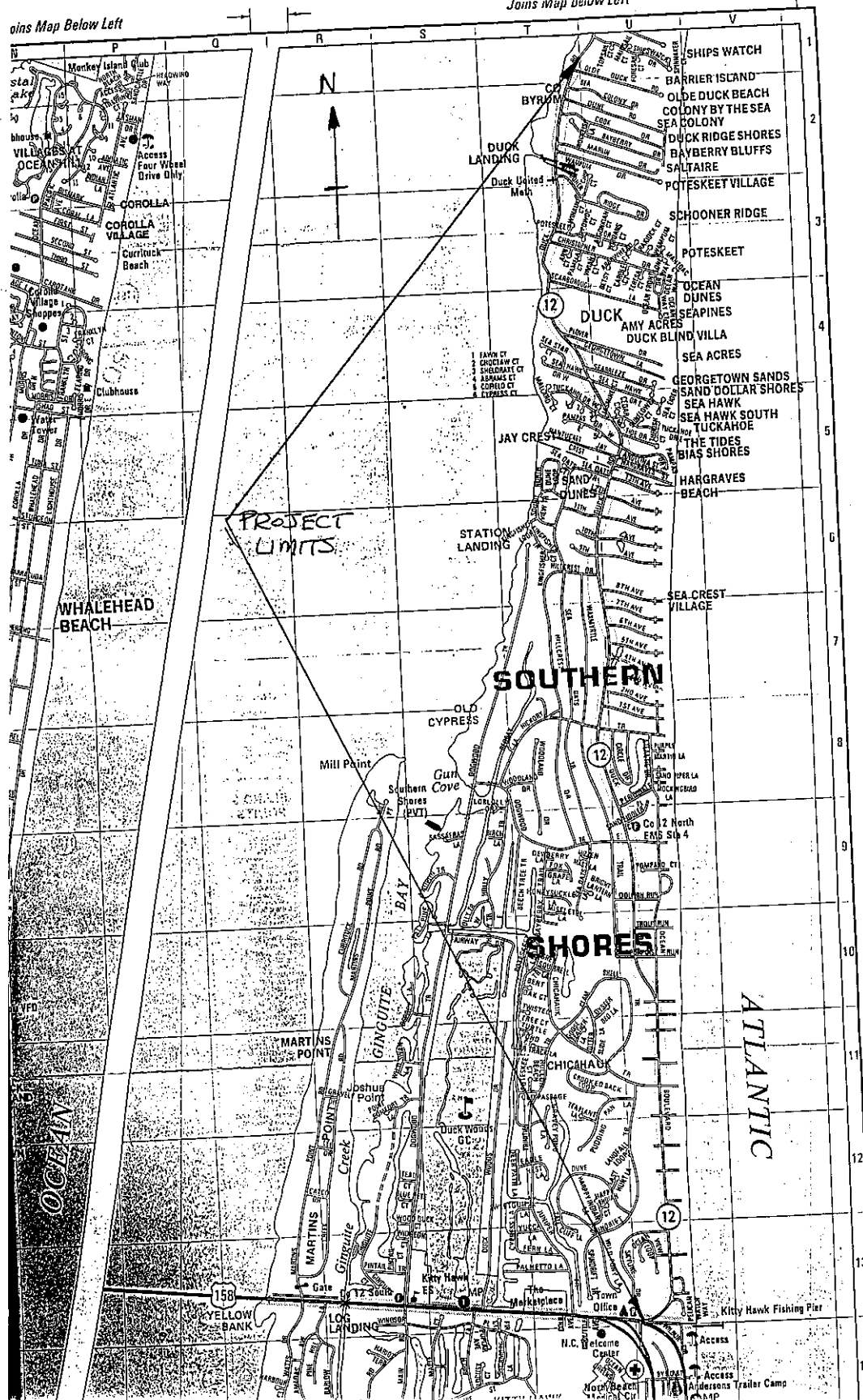
Utility conflicts are expected to be moderate. There is a major underground power line located inside of existing right of way along NC 12. This line will need to be relocated prior to construction. The Right of Way estimate includes \$100,000 for relocating existing overhead telephone lines. The Right of Way estimate also includes providing 70 feet of right of way along the west side of NC 12, measured from the eastern edge of the existing pavement, from US 158 to the north property line of Southern Shores Realty, and an additional 10 feet of right of way for a length of 0.16 miles on the eastern side of NC 12 from Resort Realty to Barrier Island Station in Duck.

IV. OTHER COMMENTS AND CONCERNS

It is estimated that this project will not require the relocation of any residences or businesses.

The placing of fill on this project will require a Corps of Engineers, Section 404 Permit. There are not any sensitive resources within the project limits. A CAMA permit will be required due to impact to adjacent area of environmental concern within the area of Barrier Island Station. Construction within this area may impact the adjacent Estaurine Shoreline of the Currituck Sound.

oins Map Below Left





RECEIVED

JUL 10 1995

DIVISION 1
OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

JAMES B. HUNT, JR.
GOVERNOR

DIVISION OF HIGHWAYS
P.O. BOX 25201, RALEIGH, N.C. 27611-5201

R. SAMUEL HUNT III
SECRETARY

July 6, 1995

MEMORANDUM TO: Don R. Conner, P. E.
Division Engineer

FROM: Larry R. Goode, Ph. D., P. E. *Larry Goode*
State Highway Administrator

SUBJECT: NC 12 Improvements, Dare County

Thank you for your recent memorandum requesting that NC 12 be widened from US 158 through the Village of Duck.

Please have your staff collect more information with specific details on the scope and cost of these improvements. Send me your recommendations as a division feasibility study so we can consider this project during next year's TIP update.

Thank you for your assistance in this matter. If I can give you any additional information, please let me know.

LRG/ds

cc: Garland B. Garrett, Jr.
R. V. Owens
Calvin W. Leggett, P. E.
Whitmel H. Webb, P. E.



| Project | | Engineer's Estimate | | | |
|---|----------------------------|---------------------|------|-------------|-----------------|
| Dare County | | | | | |
| NC 12 From East of US 158 Northward 6.1 Miles | | | | | |
| | | | | | |
| | | | | Unit | |
| | Description | Quant. | Unit | Price | Amount |
| | Earth Work | 24,000 | CY | \$ 10.50 | \$ 252,000.00 |
| | Asphalt Cement | 2790 | TON | \$ 160.00 | \$ 446,400.00 |
| | 6" HB Base Course | 29,400 | TON | \$ 45.00 | \$ 1,323,000.00 |
| | 2" HDS Binder Course | 9930 | TON | \$ 50.00 | \$ 496,500.00 |
| | 2" HDS Surface Course | 21,779 | TON | \$ 45.00 | \$ 980,055.00 |
| | Subgrade Stabilization | 85,192 | SY | \$ 4.00 | \$ 340,768.00 |
| | 6" Concrete Driveway | 1710 | SY | \$ 30.00 | \$ 51,300.00 |
| | Erosion Control | 10.5 | ACR | \$ 4,000.00 | \$ 42,000.00 |
| | New Traffic Signal | 4 | EA | \$60,000.00 | \$ 240,000.00 |
| | Pole Relocation | 4 | EA | \$ 1,000.00 | \$ 4,000.00 |
| | Traffic Control | 6.1 | Mi | \$10,000.00 | \$ 61,000.00 |
| | Thermo & Markers (4 Lanes) | 4.9 | Mi | \$16,000.00 | \$ 78,400.00 |
| | Thermo & Markers (3 Lanes) | 1.2 | Mi | \$14,000.00 | \$ 16,800.00 |
| | Misc & Mobilization (30%) | LS | LS | | \$ 1,289,380.00 |
| | | | | | |
| | | Contract Cost: | | | \$ 5,621,603.00 |
| | | E & C (15 %) | | | \$ 843,240.00 |
| | | | | | \$ 6,464,843.00 |



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

JAMES B. HUNT JR.
GOVERNOR

GARLAND B. GARRETT JR.
SECRETARY

P.O. Box 1405
Elizabeth City, N.C. 27906-1405
Phone: (919) 331-4737
Fax: (919) 331-4739
Cell: (919) 333-2048

September 12, 1995

MEMORANDUM TO: Lydia McKeel, Division Staff Engineer
Division One

FROM: M. Randall Turner, Div. 1 Environmental Officer
Planning & Environmental Branch

SUBJECT: Environmental Screening for Proposed Improvements to
NC-12 from Ocean Blvd. in Southern Shores to Ships Watch
at Duck; Dare County; Feasibility Study

At your request I have completed a cursory examination of the major environmental issues which have the potential to complicate the proposed action.

- Waters of the U.S. (Wetlands and Surface Waters): Very minimal involvement with this Section 404 resource; proposed footprint will only impact 2-3 small wetland sites for entire project; Nationwide authorization anticipated. **Jurisdictional Agencies: U.S. Army Corps of Engineers (COE) and Division of Environmental Management (DEM)**
- Areas of Environmental Concern (AEC's): The only AEC involvement along the entire project is Estuarine Waters/Estuarine Shoreline AEC's of the Currituck Sound at the north end of the project where the existing alignment gets so close to the shoreline; eastside widening in this area may be the only feasible alternative; if this alternative is chosen, CAMA permit will be minor issue, otherwise, a major permit issue may ensue. **Jurisdictional Agency: Division of Coastal Management (DCM)**
- Sensitive Watersheds: Neither Outstanding Resource Waters, High Quality Waters, nor Primary Nursery Areas are located within 575 feet of the project, as proposed, consequently, no extraordinary permits are anticipated. **Jurisdictional Agencies: DCM and DEM, Division of Marine Fisheries (DMF)**
- Protected Species: None of the federally protected species listed for Dare County utilize habitat that is likely to be impacted by the proposed action; no problems with federally endangered or threatened species are anticipated. **Jurisdictional Agencies: U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), DMF, N.C. Wildlife Resources Commission (WRC) and the N.C. Natural Heritage Program (NHP)**
- Rare/Unique Natural Habitats: Since only minimal impacts to vegetated areas will occur immediately adjacent to the existing roadway, no impacts to rare communities are anticipated. **Jurisdictional Agency (NHP)**

Memo To: Lydia

From:

Turnage

Subject: Traffic Accident - Strip Analysis
NC 12 from US 158 Northward for
6.02 miles - Dare Co.

During the period from July 1, 1987, through
1 1 1 2 2 2 accidents



Pomona Pipe Products

POMONA
SUPPLY
COMPANY

P.O. Box 20400
Greensboro, N.C. 27420

TEL: (919) 292-8060
FAX: (919) 292-2251

NC 12 - Feasibility Study

Utility Conflicts:

All pipe in R/W is min SDR 21
PVC or Ductile Iron pipe per
Sammy Midgett w/ Dare Co H₂O

Ayden Flowers says these lines
can be paved over rather than
relocated further away from ex.st.
EOP.

Therefore, do not anticipate other
needed funds for waterline
relocation

There may be some fire hydrant
adjustments

Logan Vitrified Clay Pipe
Contech Distributor
Fiberglass Pipe
Air/Vac Test Equipment

Flue Liners & Firebrick
Aluminum Drainage Products
Manholes & IPA Rehab
Plugs, Couplings, Adaptors

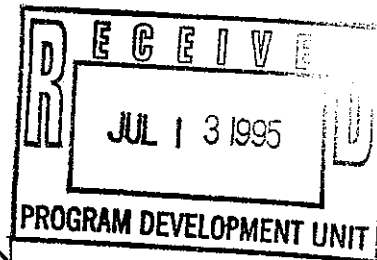
Table 2
Traffic Considerations

| | North | | Central | | | | | | South | |
|--|--------|---|---------|---|--------|---|--------|---|--------|---|
| | 1 | 2 | 1 | 2 | 3 | 4 | 5 | 6 | | |
| Average Annual Daily Traffic and Peak Hour Level of Service | | | | | | | | | | |
| • US 158 at Intracoastal Waterway Bridge | | | | | | | | | | |
| -1995 | 15,600 | B | 15,600 | B | 15,600 | B | 15,600 | B | 15,600 | B |
| -2020 with No Bridge | 36,800 | D | 36,800 | D | 36,800 | D | 36,800 | D | 36,800 | D |
| -2020 with Bridge | 36,800 | D | 36,800 | D | 36,800 | D | 36,800 | D | 36,800 | D |
| • US 158 Just South of Mainland Bridge Approach | | | | | | | | | | |
| -1995 | 14,600 | B | 14,800 | B | 14,800 | B | 14,800 | B | 14,800 | B |
| -2020 with No Bridge | 34,600 | D | 35,200 | D | 35,200 | D | 35,200 | D | 35,200 | D |
| -2020 with Bridge | 24,800 | C | 23,400 | C | 23,400 | C | 23,400 | C | 23,400 | C |
| • Wright Memorial Bridge | | | | | | | | | | |
| -1995 | 21,800 | B | 21,800 | B | 21,800 | B | 21,800 | B | 21,800 | B |
| -2020 with No Bridge | 42,800 | D | 42,800 | D | 42,800 | D | 42,800 | D | 42,800 | D |
| -2020 with Bridge | 31,000 | C | 31,000 | C | 31,000 | C | 31,000 | C | 31,000 | C |
| • Mid-Currituck County bridge and approaches - 2020 | | | | | | | | | | |
| -1995 | 11,800 | D | 11,800 | D | 11,800 | D | 11,800 | D | 11,800 | D |
| -2020 with No Bridge | 21,800 | B | 21,800 | B | 21,800 | B | 21,800 | B | 21,800 | B |
| -2020 with Bridge | 42,800 | D | 42,800 | D | 42,800 | D | 42,800 | D | 42,800 | D |
| -2020 with Bridge | 31,000 | C | 31,000 | C | 31,000 | C | 31,000 | C | 31,000 | C |
| • NC 12 at Corolla Village | | | | | | | | | | |
| -1995 | 1,800 | B | 1,800 | B | 1,800 | B | 1,800 | B | 1,800 | B |
| -2020 with No Bridge | 5,400 | C | 5,400 | C | 5,400 | C | 5,400 | C | 5,400 | C |
| -2020 with Bridge | 5,400 | C | 5,400 | C | 5,400 | C | 5,400 | C | 5,400 | C |
| • NC 12 Just North of Bridge Termini | | | | | | | | | | |
| -1995 | 5,400 | C | 9,200 | D | 9,200 | D | 9,200 | D | 9,200 | D |
| -2020 with Bridge | 10,000 | D | 8,600 | D | 8,600 | D | 8,600 | D | 8,600 | D |
| • NC 12 Just South of Bridge Termini | | | | | | | | | | |
| -1995 | 20,800 | F | 20,800 | F | 20,800 | F | 20,800 | F | 20,800 | F |
| -2020 with No Bridge | 39,000 | F | 39,000 | F | 39,000 | F | 39,000 | F | 39,000 | F |
| -2020 with Bridge | 28,400 | F | 28,400 | F | 28,400 | F | 28,400 | F | 28,400 | F |

Peak Hour Level of Service

| | | | |
|---|-------------------------------------|------------------------------------|---|
| ■ | 1995 Average Annual | - US 158: B | - |
| ■ | | - Wright Memorial Bridge: B | - |
| ■ | | - NC 12 at Corolla: B | - |
| ■ | | - NC 12 at Southern Shores: F | - |
| ■ | | - Mainland local roads: A | - |
| ■ | 1995 Average Summer | - US 158: B to C | - |
| ■ | | - Wright Memorial Bridge: C | - |
| ■ | | - NC 12 at Corolla: B | - |
| ■ | | - NC 12 at Southern Shores: F | - |
| ■ | | - Mainland local roads: A to B | - |
| ■ | 2020 No-Build Annual | - US 158: D to E | - |
| ■ | | - Wright Memorial Bridge: D | - |
| ■ | | - NC 12 at Corolla: C | - |
| ■ | | - NC 12 at Southern Shores: F | - |
| ■ | | - Mainland local roads: A to B | - |
| ■ | 2020 No-Build Average Summer | - US 158: F | - |
| ■ | | - Wright Memorial Bridge: E | - |
| ■ | | - NC 12 at Corolla: D | - |
| ■ | | - NC 12 at Southern Shores: F | - |
| ■ | | - Mainland local roads: A to B | - |
| ■ | 2020 Build Annual | - US 158: C south of new bridge; D | - |
| ■ | | - north of new bridge | - |
| ■ | | - Wright Memorial Bridge: C | - |
| ■ | | - New Bridge and approaches: D | - |
| ■ | | - NC 12 at Corolla: C | - |
| ■ | | - NC 12 at new bridge: C to D | - |
| ■ | | - except Currituck Shooting Club | - |
| ■ | | - terminus where E to F | - |
| ■ | | - NC 12 at Southern Shores: F | - |
| ■ | | - Mainland local roads: A to B | - |
| ■ | 2020 Build Average Summer | - US 158: D to E south of new | - |
| ■ | | - bridge; F north of new bridge | - |
| ■ | | - Wright Memorial Bridge: D | - |
| ■ | | - New Bridge and approaches: E | - |
| ■ | | - NC 12 at Corolla: D | - |
| ■ | | - NC 12 at new bridge: D to E | - |
| ■ | | - except Currituck Shooting Club | - |
| ■ | | - terminus where F | - |
| ■ | | - NC 12 at Southern Shores: F | - |
| ■ | | - Mainland local roads: A to B | - |
| ■ | 2020 No-Build Average Annual | - US 158: D to E | - |
| ■ | | - Wright Memorial Bridge: D | - |
| ■ | | - NC 12 at Corolla: C | - |
| ■ | | - NC 12 at Southern Shores: F | - |
| ■ | | - Mainland local roads: A to B | - |
| ■ | 2020 No-Build Average Summer | - US 158: F | - |
| ■ | | - Wright Memorial Bridge: E | - |
| ■ | | - NC 12 at Corolla: D | - |
| ■ | | - NC 12 at Southern Shores: F | - |
| ■ | | - Mainland local roads: A to B | - |

Mr. Whit Webb, P.E.



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

JAMES B. HUNT, JR.
GOVERNOR

DIVISION OF HIGHWAYS

R. SAMUEL HUNT III
SECRETARY

P. O. Box 748
Ahoskie, North Carolina 27910
July 11, 1995

*cc: D. Modlin
sig Whit*

MEMORANDUM TO: Ms. Lydia McKeel
Division Staff Engineer

FROM: D. R. Conner, P. E. *D.R. Conner*
Division Engineer - Division One *(wc)*

SUBJECT: NC 12 Improvements, Dare County

Please prepare a feasibility study for improvements to NC 12 from US 158 through the village of Duck. Mr. Dave Modlin has completed one for NC 12 from US 158 north for 2 miles and this can be incorporated into your study.

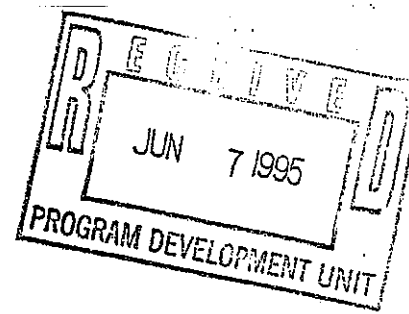
If you have any questions, please advise.

DRC/wcc
Attachment

cc: Mr. J. D. Jennings
Mr. Calvin Leggett, P. E.
Mr. Whit Webb, P. E. ✓



cc: Mallin
L. Koc



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

JAMES B. HUNT, JR.
GOVERNOR

DIVISION OF HIGHWAYS

Ahoskie, North Carolina 27910

June 2, 1995

R. SAMUEL HUNT III
SECRETARY

cc: Whit
J. Kelley

MEMORANDUM TO: Mr. R. V. Owens, III
Board of Transportation Member

FROM: D. R. Conner, P. E. *D. R. Conner*
Division Engineer - Division One (M)

SUBJECT: Cost Estimate to Widen NC 12 from US 158 through the
Village of Duck - Dare County

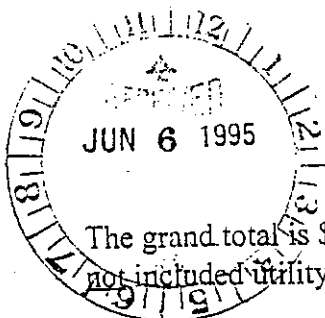
As you requested, we have prepared a cost estimate to widen NC 12 to four lanes from US 158 to Duck and to three lanes through the Village of Duck. A summary follows:

NC 12 from US 158 to Duck (4 lanes, 4.9 miles)

| | |
|--------------|--------------------|
| Right of Way | \$2,390,000 |
| Construction | 4,900,000 |
| Total | <u>\$7,290,000</u> |

NC 12 through Duck (3 lanes, 1.2 miles)

| | |
|--------------|-------------------|
| Right of Way | \$ 75,000 |
| Construction | 250,000 |
| Bike Lane | 100,000 |
| Total | <u>\$ 425,000</u> |



The grand total is \$7,715,000. The right of way cost at Duck is only a guess. We have not included utility relocation costs.

If you need additional information, please advise.

DRC/dm

cc: Mr. Whit Webb, P. E.

Mr. J. D. Jennings

